

and much of the ability which distinguished his father and grandfather. As a mathematician, physicist, and observer, Prof. Herschel was *facile princeps*; and it was fortunate for meteoric astronomy that he devoted himself to its practical and theoretical investigation. Sir John and Sir William Herschel had swept the heavens with large telescopes in quest of nebulae, double stars, and other objects, but Prof. Alexander Herschel appears to have preferred naked-eye observation to instrumental work. For about half a century he watched diligently for meteors, and obtained numerous and valuable results, as past volumes of the *Monthly Notices of the Royal Astronomical Society* and *NATURE* fully attest.

Apart from his observational results Prof. Herschel accomplished a large amount of important work in the summation, reduction, and discussion of various other observations. In conjunction with Mr. R. P. Greg he formed several extensive catalogues of the radiant points of shooting stars, and the most important of these were published in 1868, 1872, and 1874. One of his greatest successes, though it has been little commented upon, was the prediction made in the *Monthly Notices*, vol. xxxii., p. 355, of the great Bielid shower of 1872 November 27. For many years he compiled the annual reports of the luminous meteor committee of the British Association, and contributed, until 1880, the yearly notes on meteoric astronomy published in the anniversary number (February) of the *Monthly Notices*.

Prof. Herschel was a voluminous writer, and all those who enjoyed the pleasure of corresponding with him will agree that his letters were just as interesting as they were long. The writer of this notice will always have reason to be grateful to him for kind encouragement, advice, and instruction in the earlier years of his observing career. It is not too much to say that without the deep interest incited by Prof. Herschel's letters the meteoric observations obtained at Bristol during the last thirty-five years may never have been made.

As an observer of shooting stars Prof. Herschel was remarkably accurate, and he not only recorded their apparent paths with fidelity, but accompanied his results with descriptive details marvellous in their fulness. He computed the real paths of a great many fireballs and ordinary falling stars, and very ably discussed the often discordant observations which formed the basis of these inquiries.

The present writer has often been impressed at the acumen and sound judgment he displayed in dealing with difficult materials of this character. Meteoric astronomy has indeed lost one of its ablest votaries in Prof. Herschel, and it may truly be said that the present high position of this branch of science is due in no small measure to his prolonged and able researches.

W. F. DENNING.

#### NOTES.

A CORRESPONDENT recently directed our attention to a sensational report that certain signals are regularly received at one of the Marconi wireless telegraph stations, and are believed to be communications from Mars or another planet. As Mars will be in opposition on July 6, and is well situated for observation in southern observatories, the rumour will probably be extensively circulated during the next few months. A copy of the report was sent, therefore, to Mr. Marconi, who has favoured us with the following reply:—"There is no truth whatever in the statement which has been freely published for the last year or two that mysterious signals have been received at Cape Clear from probably some distant planet.

There is, in the first place, no wireless telegraph station at Cape Clear. The stray or vagrant electrical effects which do manifest themselves from time to time at wireless telegraph stations are due to atmospheric discharges or other natural causes. To attribute this phenomenon to any such source as is contemplated in these newspaper reports is, so far, purely imaginative and idle speculation."

WE regret to have to record the death of the well-known ironmaster, Mr. Thomas Andrews, F.R.S., at Wortley, near Sheffield, on June 19. Mr. Andrews was born at Sheffield in 1847, and succeeded his father as proprietor of the Wortley Iron Works many years ago. He was the author of numerous papers, chiefly on metallurgical subjects, but his researches were of a varied nature, and included such widely separated subjects as the composition of river waters and the strength of railway axles. Of late years his writings dealt chiefly with the micro-structure of metals, carrying on work which originated in Sheffield. He was awarded a Telford medal and premium by the Institution of Civil Engineers in 1884, and was elected a Fellow of the Royal Society in 1888. He was also a gold medallist and Bessemer prizeman of the Society of Engineers, London.

MR. A. W. HILL, fellow and dean of King's College, Cambridge, and university lecturer in botany, has been appointed assistant director of the Royal Gardens, Kew.

PROFS. GUIDO CASTELNUOVO, of Rome, George William Hill, of New York, Camille Jordan, of Paris, and Vito Volterra, of Rome, have been elected honorary members of the London Mathematical Society.

A CHARTER of incorporation has been granted by the King to the Society of Chemical Industry, which was founded in 1881 to promote the application of chemical science to arts and manufactures.

A COMMITTEE has been appointed by the President of the Board of Agriculture and Fisheries to inquire into the nature of distemper in dogs in Great Britain and the methods of its infection, and to report whether any, and, if so, what preventive or remedial measures, exclusive of ordinary medical treatment, can with advantage be taken with respect to it.

A CONFERENCE on the prevention of infant mortality and the welfare of nursing mothers and suckling infants will be held at the Town Hall, Pancras Road, N.W., on July 1, at 3.30 p.m., to inaugurate the opening of the School for Mothers at 6 and 7 Chalton Street, Euston Road, N.W., the centre of the St. Pancras Mothers' and Infants' Society. The Mayor of St. Pancras will welcome the conference, and Lord Robert Cecil will preside.

ON Monday next, July 1, at 2.30 (weather permitting), there will be a display of scientific kites and other aeronautical experiments on Chobham Common, Sunningdale, where the Aeronautical Society will hold the concluding meeting of the present session. Kites will be displayed by Mr. W. H. Dines, F.R.S., Mr. C. J. P. Cave, Mr. S. H. R. Salmon, and Mr. R. M. Balston. Mr. Cave will send up pilot balloons to determine the rate and direction of the wind at different heights, and demonstrations of the method will be given by means of a theodolite specially made from designs by M. de Quervain. Mr. Cave will also send up a *ballon-sonde* carrying self-recording instruments complete, as used by him for the international aeronautical ascents, which take place on fixed days simultaneously throughout Europe. Mr. José Weiss will perform experiments with model gliders.

As the result of an extensive correspondence with entomologists of various countries of Europe and America, it has been decided to issue, in the course of this summer, invitations for an International Congress of Entomology, to meet in 1908, probably at Brussels. The purpose of the congress is the promotion of the interests of entomology, and therefore of biology in general, by furthering cordial cooperation between the entomologists of different countries, and by stimulating research and directing it into channels where it may be most fruitful or where special research is most needed. Questions of applied entomology will likewise be dealt with in lectures and discussions, the large experience of devotees to pure entomology being applicable, with profit, to economic and hygienic entomology. Entomologists are cordially invited to advise and assist in the organisation of the congress. All communications, until further notice, should be addressed to Dr. K. Jordan, Zoological Museum, Tring (Herts).

THE fifth annual meeting of the South African Association for the Advancement of Science will be held in Natal on July 10-17 next under the presidency of Dr. James Hyslop, D.S.O. The first part of the meeting, from July 10 to July 13, will be held at Pietermaritzburg, and the second part at Durban. The council of the association has revised the arrangement of the sections. Section A, the president of which this year is Mr. E. Nevill, comprises mathematics, physics, astronomy, meteorology, geodesy, and geography. Sections B and C, including chemistry, metallurgy, mineralogy and geology, engineering, mining, and architecture, will be presided over by Mr. Cathcart W. Methven. The president of Section D, Mr. H. Watkins Pitchford, will take the chair at meetings concerned with botany, zoology, agriculture and forestry, bacteriology, physiology, and hygiene. Mr. R. D. Clark is the president of Sections E and F, before which papers will be read on education, philology, psychology, history, archaeology, economics and statistics, sociology, anthropology and ethnology. It will be remembered that, in connection with the South African medal and fund, the council of the British Association adopted a resolution "that, in accordance with the wishes of the subscribers, the South African Medal Fund be vested in the names of the trustees appointed by the South African Association for the Advancement of Science; and that the dues for the medal be transferred to the association, to which in its corporate capacity the administration of the fund and the award of the medal shall be and is hereby entrusted under the conditions specified in the report of the medal committee." The council of the South African Association accepted with high appreciation the offer made by the British Association, and undertook the award of the medal and fund in accordance with the terms of the conveyance. The fund, amounting to 1376*l.*, has been invested, and rules for the award of the medal and fund are being framed and will be dealt with at the forthcoming meeting. It is intended that the first award shall be made at the 1908 meeting of the association. The assistant general secretaries are Mr. E. Hope Jones for Cape Colony and Rhodesia, and Mr. Fred Rowland for the Transvaal, Orange River Colony and Natal. They may be addressed at P.O. Box 1497, Cape Town.

THE first part of a new serial, *Records of the Canterbury Museum (N.Z.)*, is devoted to a list of New Zealand fishes, by Mr. E. R. Waite, based on the one in the late Captain Hutton's "*Index Faunæ Novæ Zealandiæ*," but containing references to the original descriptions.

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ARTICLES on the fresh water bryozoans of the country and the plankton of the coast—the former by Dr. A. Oka and the latter by Mr. K. Okamura—are included in the latest issue (vol. vi., part ii.) of *Annotationes Zoologicae Japonenses*.

No. 10 of the Indian Forest Bulletin is devoted to an account, by Mr. E. P. Stebbing, of the ravages inflicted by a longicorn beetle (*Butocera rubus*) on fig-trees in Baluchistan. The beetles made their appearance two years ago in a garden in the Duki district noted for the size of its fig-trees, on which they have inflicted very serious injuries. It is hoped, however, that by the use of suitable remedies the plague will shortly be stayed.

ACCORDING to the annual report for the year 1906, the Zoological Society of Philadelphia is in a rather unsatisfactory financial condition, owing to the increased cost of almost everything connected with the upkeep of the menagerie. The result is an account overdrawn by nearly 3000 dollars. Neither have animals been acquired so rapidly as usual, very few new to the collection having been added during the year.

DESPITE the plethora of popular ornithological literature, there seems certainly room for a journal devoted to the purpose of recording recent additions to our knowledge of the birds on the British list. This gap is to be supplied by *British Birds; an Illustrated Magazine devoted to the Birds on the British List*, of which the first (June) number is now before us. Edited by Mr. H. F. Witherby, with the assistance of Mr. W. P. Pycraft, the magazine is to be published monthly by Witherby and Co. at the price of one shilling. The frontispiece to the first part is an exquisite photograph of an osprey descending on its nest, the most important article in this issue being one in which Mr. Howard Saunders enumerates the species added to the British list since 1899.

IN the May number of the *Quarterly Journal of Microscopical Science* Miss Georgina Sweet, of Melbourne, continues her elaborate account of the anatomy of the marsupial mole (*Notoryctes typhlops*), dealing in this instance with the structure of the skin, hair, and reproductive organs. In examining the structure of the skin of the head, certain curious modified groups of cells with a more or less definite arrangement were detected, and similar cells were also found to exist in a modified patch of skin on the rump as well as in the region of the pouch. Although direct proof of the existence of nervous function is lacking, it seems probable that these modified cells represent some form of tactile sense-organ, which would obviously be of very considerable use to a blind burrowing creature like *Notoryctes*. It is unfortunate that at present nothing is known with regard to the embryology and development of this remarkable animal.

TO the first part of vol. xvi. of *Anales Mus. Nat. Buenos Aires* Dr. F. Ameghino contributes four interesting plates in which skeletons of the extinct *Hippidium* and *Machærodus* (*Smilodon*) of Argentina are respectively contrasted with those of the modern horse and tiger. In its huge skull and short limbs the extinct horse presents a remarkable contrast to its existing representative. It may be added that, through the kind offices of Dr. Ameghino, plaster reproductions of the skeletons of the two extinct species are now exhibited in the British Museum (Natural History). In a second paper in the same issue the author records the existence of what he regards as rudimentary horns in certain members of the toxodont group. In one instance (*Trigodon*) the rudiment takes the form of a low

median frontal boss, compared by its describer to that of the Old World Elasmotherium, but in a skull figured under the name of *Ceratoxodon* there appear to be at least four pairs of smaller prominences.

THE fifth annual report of the Rhodesia Museum (Bulawayo, 1907) shows that the accessions to the museum in 1906 exceeded in importance those of any previous year, and that the number of visitors was 292. A considerable number of interesting minerals and rocks were examined during the year, the number of identifications made for prospectors having been exceptionally large. Gem-stones were especially in evidence. For the guidance of prospectors, an able essay on the mineral wealth of Rhodesia has been written by the curator, Mr. F. P. Mennell, and is appended to the report. With the appointment of Mr. E. C. Chubb, of the British Museum (Natural History), as an additional member of the staff to take charge of the zoological department, the activity of the museum cannot fail to be increased in various directions.

OF the various branches of work undertaken by the Liverpool Institute of Tropical Research, the most productive and useful have been the missions abroad, especially the two expeditions to West Africa, where the representatives of the institute had the opportunity of noting conditions and resources, and brought away valuable collections. The results are summarised by the director, Viscount Mountmorres, in the fourth number of the Quarterly Journal issued by the institute. In the same number Dr. D. Spence communicates an account of two substances prepared from the resin of *Ficus Vogelii*, leading to the conclusion that the resinous products are closely related to caoutchouc; and Mr. R. Newstead discusses three types of weevils that are found in West African grain, and the suggested methods of destruction.

A PAMPHLET has been received in which the author, Mr. P. Frazer, describes experiments undertaken with the view of tracing the sources of injury to vegetation in the neighbourhood of manufacturing works. The results are in accord with former investigations, that the poisonous effects are produced chiefly by fumes of sulphur coming into direct contact with the leaves of plants, while the acids percolating into the soil do not injure the roots. A full bibliography is appended to the paper, which was read in April at the New York meeting of the American Institute of Mining Engineers.

It has been observed that when potato plants are grown in a very moist atmosphere, swellings or intumescences often develop on the leaves. An account of experiments undertaken by Miss E. Douglas to examine their origin and discover the causes regulating their production was published in the *Botanical Gazette* (April). The intumescences are due to the growth of the cells, generally the palisade cells of the mesophyll, that elongate and divide until they break through the epidermal layer. The experiments indicate that the growth is the result of an abnormal state of turgescence when more water is absorbed than can be transpired or used in normal growth, and this is probably caused by the accumulation of osmotically active glucose.

THE twentieth volume of the Journal of the College of Science, Tokio University, is devoted to an enumeration of flowering plants and ferns from Formosa, compiled by Prof. J. Matsumura and Mr. B. Hayata. The compilation is based on specimens collected by several Japanese

botanists who have toured through the island, their routes being shown upon an accompanying map. The number of new species is not very great, and the majority are figured in the excellent plates appended. Under *Spiraea prunifolia*, a plant that with double flowers is common in Japan, the authors describe a single-flowered plant, and mention that it is the first they have seen. A new order, Alniphyllaceæ, is proposed for a plant receiving the name of *Alniphyllum pterospermum*, that bears strong affinities both to the *Styracææ* and *Ericacææ*.

SOME admirably planned and instructive investigations carried out by Mr. W. J. Cudworth and Mr. Wilson Worsdell on the North-Eastern Railway are described in *Engineering* of June 14. The object of the investigations, which have extended over four years, was to ascertain the cause of the inequalities which from time to time develop on the surface of rails. The results, though not conclusive, are stimulating. They show that the structure of the metal is an important factor in the wear and tear of rails, the difference in structure being probably due to the varying conditions of temperature and the different speeds at which the rails are rolled. The hard knobs which develop in the course of usage on all lines may be produced by mechanical action due to vibration when the wheels are passing over the rails.

THE first report of the Royal Commission on Mines has been issued (Cd. 3548, price 1s. 3d.). The Royal Commission, of which Lord Monkswell is chairman, was appointed on June 6, 1906, to consider questions concerning the health and safety of miners. The present report, which covers fifty-two pages, is devoted to the use of breathing appliances. The Commissioners do not suggest that the use of such appliances, the compulsory provision of which would not be justified at present, is likely to lead to any considerable decrease in the number of lives lost by explosions. Apart from actual rescue work, they may, however, be of great service in making it possible to deal with underground fires safely and effectively. The use of breathing appliances is not unattended by risks, but such risks can be reduced to a minimum by a proper system of training, which could be provided by the establishment of central rescue stations. Appended to the report are reports on breathing apparatus, by Dr. Boycott; on colliery fires, by a committee of the South Yorkshire Coalowners' Association; on rescue apparatus, by a committee of the Fife and Clackmannan Coalowners' Association; and on breathing apparatus, by a French commission. For educational purposes the value of the report is enhanced by the accompanying detailed drawings of the pneumatogen, the Draeger, the Shamrock, the improved Fleuss, the Weg, and the Aërolith apparatus.

PROF. HANN presented a treatise on the daily range of temperature in the tropical regions of Asia and Australia to the Vienna Academy on April 25, being the conclusion of a laborious discussion of the daily range of temperature in the tropics. The principal object of the treatise in question was to obtain corrections for reducing to the true daily mean the means obtained from combinations of observations at various hours. The author finds that the best mean is obtained from the readings at  $(7+2+9+9):4$  both for coast and inland stations, and that the mean obtained from the readings of the maximum and minimum thermometers, which is most usually adopted, is, except for higher latitudes, the worst that can be employed; a mean obtained from even two fixed hours daily would be more satisfactory than the mean of the daily extremes.

THE mean and extreme meteorological values for twenty-five stations in the British Empire during the year 1905 are given in *Symons's Meteorological Magazine* for May. So far as these stations are concerned, the following high shade temperatures were recorded:—Calcutta,  $106^{\circ}.1$  (June); Madras,  $107^{\circ}.9$  (May); Melbourne and Coolgardie (West Australia),  $108^{\circ}.5$  (January); Adelaide,  $109^{\circ}.7$  (January). The lowest readings were:—Fredericton (New Brunswick),  $-33^{\circ}.5$ , Winnipeg,  $-39^{\circ}.1$ , Dawson,  $-50^{\circ}.5$  (all in January); the latter station had the lowest mean temperature ( $25^{\circ}.2$ ). Coolgardie had the highest temperature in the sun's rays,  $178^{\circ}.8$ , the lowest mean humidity, 52 per cent., and least rainfall, 7.86 inches. The greatest rainfall, 77.89 inches, was at Grenada, and the dampest station was London, 83 per cent. Similar valuable tables have been published monthly for more than twenty-five years, but it must be clearly understood that these few widely scattered stations are quite insufficient to give a complete conspectus of the climate of the vast area included in the British Empire.

THE new method of lighting which has recently been installed in the courtyard of the Savoy Hotel is creating much interest, and is, we believe, the first installation of this particular system in this country. The system is the result of years of experimenting, and the results are now given by Mr. D. McFarlane Moore in his paper recently read before the American Institution of Electrical Engineers. The chief feature of the system is the automatic valve, which admits the exact quantity of air or gas required to prevent the violent spasmodic flickering due to the higher degree of vacuum in the tube causing a higher resistance, and which up to the present has prevented a perfect vacuum-tube lighting being placed on the market. The important points about the valve are its simplicity and its automatic action. The valve admits the air required about once a minute, and by changing the nature of the gas admitted the colour of the light can be arranged as required. The main objection to the system appears to be that a high pressure is required; consequently each tube must at the ends be led into a transformer. We should also like to know more about the initial cost of the installation, the length of life of the tube, efficiency, &c., than we are told by Mr. Moore in his paper. If the matters mentioned above are satisfactory in comparison with the present costs and efficiency of modern forms of lighting, the new system should prove of value for large shops, studios, and art galleries, where it is essential to have the lighting as near as possible to daylight. Further developments will be watched with interest, but fuller figures relating to tests will be required before the system can be considered seriously.

FROM Messrs. Hilger, Ltd., we have received a copy of their newly published "List A," in which many well-designed spectroscopes and pieces of spectroscopic apparatus are described and illustrated. The Hilger wave-length spectrometer may now be had fitted with a camera of 21 inches focal length at an additional charge of 6*l.* 10*s.* Spectroscopes will be interested, too, in the new series of six spectrographs—three of which are fitted with ultra-violet glass and three with quartz prisms and lenses—especially designed to give, with a short exposure, the whole length of spectrum, in good definition throughout, on a flat plate, and to be in permanent adjustment. The excellent results obtainable with these spectroscopes are illustrated by an enlarged copy of the spectrum of copper extending from  $\lambda$  5782 to  $\lambda$  2160, which we have examined. This was taken with a quartz spectrograph having two

$30^{\circ}$  prisms and lenses of 8" focus, the distance from  $\lambda$  6000 to  $\lambda$  2160 on the original negative being 60 mm. (2 $\frac{3}{8}$ " ), price 2*l.* 10*s.* The Michelson interferometer, reading to one ten-thousandth of a millimetre, is a fine instrument at the moderate price of 35*l.*, as is also the Jamin refractometer at 17*l.* 10*s.* Messrs. Hilger also make a speciality of the strips of plane parallel glass for the Lummer and Gehrcke parallel-plate spectroscope. The prices range from 10*l.* for a plate 100×30×10 mm. to 39*l.* for one measuring 300×40×10 mm.

"WHAT is Genius?" ("Che cosa e il genio?") is the title of a small book by Adolfo Padovan (Milan: U. Hoepli, 1907, second edition). The author discusses examples of genius among artists, poets, philosophers, and others; he distinguishes between genius and talent, and strongly advocates the view that genius is to be regarded as a healthy or physiological rather than a morbid or pathological quality. In this way he is led to the definition on the cover of the book: "a physiological state of exquisite and exceptional nervous sensibility."

DR. PAUL and Tatina Ehrenfest revive interest in the statistical problems of the kinetic theory in their paper on two of the objections to Boltzmann's minimum theorem in the *Physikalische Zeitschrift* (May). They deal, first, with Loschmidt's objection, based on the consideration of reversal of the motion, according to which for every possible direct motion there exists a possible reversed motion, and, secondly, with Zermelo's objection, based on the quasi-periodicity of the motion of a system of gas-molecules. The authors claim to have overcome these objections by showing that a state in which Boltzmann's function increases is statistically enormously improbable. It would, however, seem to follow, according to this view, that the existence of irreversible molecular phenomena must be regarded as due to the assumed preexistence of enormously improbable initial conditions.

PART vi. of "G. A. Fothergill's Sketch Book," which is published by Mr. James Dodds, of Darlington, continues the "History of Cleasby in Yorkshire, with Biography and Portraits of John Robinson, D.D., *The Last Statesman-Bishop* (1650 to 1723); and numerous Sketches of Blackwell Grange and Thornton Hall, Darlington, &c." Some good sketches of sundials are included in the part before us.

A LECTURE appreciative of the work and influence of the late Mr. Herbert Spencer, delivered by Prof. August Stadler in the Zürich Town Hall on December 6, 1906, has been published in pamphlet form by Mr. A. Müller, Zürich.

DIVISIONAL-VOLUME ii. of "Practical Coal Mining," the first divisional-volume of which was reviewed in *NATURE* of May 23 (p. 77), has just been published by the Gresham Publishing Co. The volume contains a continuation of section iv., on shaft sinking, by Prof. Henry Louis; section v., on breaking ground, by Mr. H. F. Bulman; and section vi., on methods of working and timbering, by Prof. E. H. Robertson. We propose to defer any further notice of the work until the whole of the volumes have been issued.

WE have received from the proprietors of the periodical called the *Young Citizen* (12 Salisbury Square, E.C.) a case containing twenty-four paper butterflies, pinned and outspread to resemble real specimens. They are, we believe, copied from a well-known work on the subject, and at a considerable distance might pass muster, but we

regret that we are unable to speak favourably of the scheme. The palpi are clumsily represented, but the specimens show no trace of legs, proboscis, or even antennæ, the last deficiency being the most serious and inexcusable of all, especially as they could easily have been imitated in fine wire. We cannot suppose that so incomplete a design can have been executed by, or even submitted to, anyone with the slightest knowledge of entomology. The colouring is fairly good, though in the case of some of the white butterflies it has too greenish a shade.

THE annual report of the Board of Scientific Advice for India for the year 1905-6 has reached us. It will be remembered that the Board is a central authority for the coordination of official scientific inquiry, and the object it has in view is the distribution of the work of research to the best advantage, the prevention of dissipation of energy by the useless duplication of inquiries, and its misdirection by a lack of inter-departmental cooperation. The Board by its advice also aids the Government of India in prosecuting practical research into questions of economic or applied science. During 1906 the Board appears to have held two meetings only, one at Simla in May and the other in December at Calcutta. The greater part of the report, which runs to nearly 200 pages, is made up of contributions by distinguished specialists on scientific work in various directions accomplished in India during the year under review.

### OUR ASTRONOMICAL COLUMN.

#### ASTRONOMICAL OCCURRENCES IN JULY:—

- July 3. 8h. Uranus in opposition to the Sun.  
 6. 3h. Mars in opposition to the Sun.  
 7. 7h. Vesta in conjunction with Moon (Vesta  $0^{\circ} 15' S.$ ).  
 8. 12h. 29m. Minimum of Algol ( $\beta$  Persei).  
 10. 3h. 4m. Sun eclipsed, invisible at Greenwich.  
 11. 9h. 18m. Minimum of Algol ( $\beta$  Persei).  
 13. Saturn's Ring. Major axis =  $42''.11$ , Minor =  $1''.72$ .  
 15. 19h. Jupiter in conjunction with the Sun.  
 20. 11h. 58m. to 12h. 57m. Moon occults  $\theta$  Libræ (mag. 4.3).  
 24. Partial eclipse of the Moon.  
 13h. 59m. First contact with the penumbra.  
 16h. 22m. Middle of the eclipse.  
 18h. 46m. Last contact with the penumbra.  
 Magnitude of the eclipse = 0.620.  
 At 16h. 10m. the Moon sets at Greenwich.  
 27-31. Meteors numerous from Aquarius and Perseus.  
 28. 11h. 10m. to 12h. 14m. Moon occults 30 Piscium (mag. 4.7).  
 „ 13h. 4m. to 14h. 6m. Moon occults 33 Piscium (mag. 4.6).  
 29. 11h. 23m. to 11h. 55m. Moon occults 20 Ceti (mag. 4.9).  
 31. 10h. 40m. to 11h. 18m. Moon occults  $\xi^2$  Ceti (mag. 4.3).

COMET 1907d (DANIEL).—The following set of elements and ephemeris for comet 1907d have been computed by Dr. E. Strömberg, and appear in Circular No. 98 of the Kiel Centralstelle:—

Elements.

$T = 1907 \text{ Sept. } 2.0105 \text{ (Berlin M.T.)}$

$$\begin{aligned} \omega &= 241^{\circ} 59' 04'' \\ \Omega &= 143^{\circ} 41' 99'' \\ i &= 6^{\circ} 14' 81'' \end{aligned} \quad \left. \begin{array}{l} \\ \\ \end{array} \right\} 1907.0$$

$$\log q = 0.11436$$

Ephemeris 12h. M.T. Berlin.

1907	$\alpha$	$\delta$	Brightness
June 24	... $0^{\circ} 31' 3''$ ...	$+2^{\circ} 25' 9''$ ...	1.37
„ 28	... $0^{\circ} 44' 1''$ ...	$+3^{\circ} 27' 2''$ ...	1.54
July 2	... $0^{\circ} 57' 4''$ ...	$+4^{\circ} 29' 0''$ ...	1.73

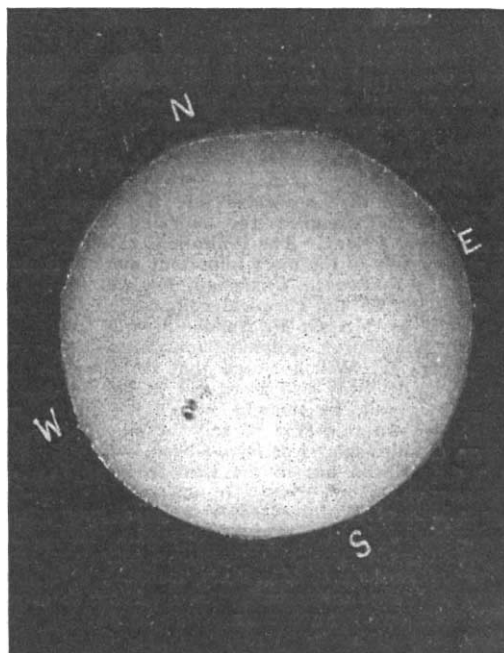
The brightness at the time of discovery, given as equal to mag. 11.0, is taken as unity. As will be seen from the above, the comet is brightening considerably, and is

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travelling through Pisces, towards Aries, just south of the ecliptic. At present it rises above the eastern horizon about midnight.

Observations by Prof. Hartwig on June 15 gave the magnitude as 9.5, the diameter as  $2'$ , and the magnitude of the nucleus as 10.0.

A LARGE SUN-SPOT.—One of the most marked features of the present year has been the large number of sun-spot groups of sufficient magnitude to be seen with the naked eye; according to the Greenwich report, fourteen such groups had been seen on the solar disc up to May 10. The accompanying photograph, taken at 2h. 30m. on June 21, shows the group of spots which appeared on



the eastern limb on Thursday, June 13, and for several days was quite an easy naked-eye object. The latitude of the group was about  $17^{\circ} S.$ , and, as may be seen from the reproduction, its extreme length was about one-tenth of the solar diameter, or about 85,000 miles. The shape of the principal umbra changed considerably during the spot's progress across the disc.

THE VARIABILITY OF ASTEROIDS.—A striking photograph, illustrating apparently rapid changes of brightness in an asteroid, accompanies a paper on the subject published by Mr. Joel Metcalf, of Taunton (Mass.), in No. 4, vol. xxv. (p. 264, May), of the *Astrophysical Journal*. The original negative was produced by making two exposures of equal duration on the same plate, the camera being guided so that the asteroid images are round and the images of the surrounding stars are shown as trails. The similarity of the two star trails for each star is evidence that the rating of the clock and the atmospheric conditions were constant throughout, and yet there is a marked difference in the size and density of the images of the asteroid—in this case 1906 WE. This plate was taken on November 6, 1906, and the two exposures had thirty-five minutes each, with an interval of a minute between them; therefore the asteroid appears to have changed considerably in magnitude during an interval of one hour eleven minutes.

COMET 1907c (GIACOBINI).—A set of elements and a daily ephemeris extending to July 11 are given for comet 1907c by Dr. Strömberg in No. 4183 (p. 128, June 14) of the *Astronomische Nachrichten*. Prof. Millosevich, at Rome, found this a difficult object to observe with the 38 cm. (15 inches) telescope, and, according to the ephemeris, it is decreasing in brightness.